Fermilab

Title: Serving Database Information Using a Flexible Server in a Three TierArchitecture

The Dzero experiment at Fermilab relies on a central Oracle database for storing all detector calibration information. Access to this data is needed by hundreds of physics applications distributed worldwide. In order to meet the demands of these applications from scarce resources, we have created a distributed system that isolates the user applications from the database facilities. This system, known as the Database Application Network (DAN) operates as the middle tier in an three tier architecture*. A DAN server employs a hierarchical caching scheme and database connection management facility that limits access to the database resource. The modular design allows for caching strategies and database access components to be determined by runtime configuration. To solve scalability problems, a proxy database component allows for DAN servers to be arranged in a hierarchy. Also included is an event based monitoring system that is currently being used to collect statistics for performance analysis and determine problem sources. DAN servers are currently implemented as a Python multithreaded program using CORBA for network communications and interface specification. The Details of the requirements, design and implementation of DAN are discussed along with operational experiences.

* A three tier architecture includes tier 1, the main database server, tier 2 the middle tier, in our case DAN, and tier 3 the client application.

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